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FOREST INSECT INVESTIGATIONS

INSTRUCTIONS FOR SPOTTERS AND TREATERS IN THE CONTROL OF THE DOUGLAS FIR BEETLE ON THE BLACKFEET INDIAN RESERVATION

By
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FOREST INSECT
LABORATORY

INSTRUCTIONS FOR SPOTTERS AND TREATERS IN THE CONTROL OF THE DOUGLAS FIR BEETLE ON THE BLACKFEET INDIAN RESERVATION

Prepared by the Bureau of Entomology and Plant Quarantine
Forest Insect Field Laboratory, Coeur d'Alene, Idaho

The purpose of this memorandum is to outline the duties of the men employed on the 1935 Douglas fir beetle control project on the Blackfeet Indian Reservation, the methods of spotting and treating to be employed, and to present some general information which has been found to be of value in solving situations that have occurred on other projects. Though officers in charge of the project will be in the field all of the time, they cannot be present to assist in the solution of every small confusing detail. Hence it is necessary for all men employed on the project to study these instructions carefully so that they can employ their best efforts in solving these problems. It is to be understood, however, that whenever possible, such decisions should be made by the camp manager or other project officers.

All employees are a part of the regular control organization and will be expected to assist in the moving and establishment of camp and in all other duties of the operation. They are responsible to the camp manager who will assign the work, the areas to be spotted or treated, handle supplies and see that the required forms and reports are made. In addition, it is the duty of the camp manager to spend his time in the field checking and assisting the spotting and treating crews.

Spotting

Spotting is the first and most important step in all bark-beetle control projects. The task of spotting is to locate infested trees and place their position on a map in such a manner that they can be relocated readily by the treating crews. The importance of this task will be appreciated when it is understood that infested trees missed by the spotters become a potential source of reinfestation within the area, defeating the purpose of the operation. In addition to the potential danger of reinfestation, it can readily be seen that after the expense of establishing a camp within an area, it is economically essential that all infested trees be treated. Briefly, then, it is the duty of the spotters to locate, tag and map as efficiently and economically as possible, all infested trees within the areas assigned to them.

Crew Organization and Equipment:

A six-man spotting crew is recommended for this project which consists of one chief spotter, one compassman, and four spotters. Each spotters, including the chief spotter, is equipped with a hand ax and sheath, marking crayon, and sufficient tags and tacks for one day's work. The hand axes should be rather heavy, as Douglas fir bark is thick and difficult to remove. Tags should be at least 3"x4" in size, and of a bright color (yellow or white) so that they can be seen easily by the treaters.

The compassman is equipped with a standard staff compass, staff, 2 tally registers, one 5"x8" tatum holder, map sheet, protractor and pencil.

Method of Spotting:

For the spotting of this project, it is recommended that a traverse be run along the western edge of the Douglas fir type which will be used as a base line on which stations are established four chains apart starting with the northern extremity of the infestation. Thus, station #1 will be two chains from the northern edge of the infestation, station #2 four chains south of #1, etc.

At the onset of spotting, the compassman will set his compass at station #1 and proceed due east in a straight line, taking shots with his compass at intervals when needed to keep him on an accurate course. In addition to the actual compass work, it is his duty to pace the distance so that he can construct an accurate map of the area (Fig. 1) showing the location of the trees marked for treatment and their relation to main topographic features such as trails, roads, ridges, streams, etc.

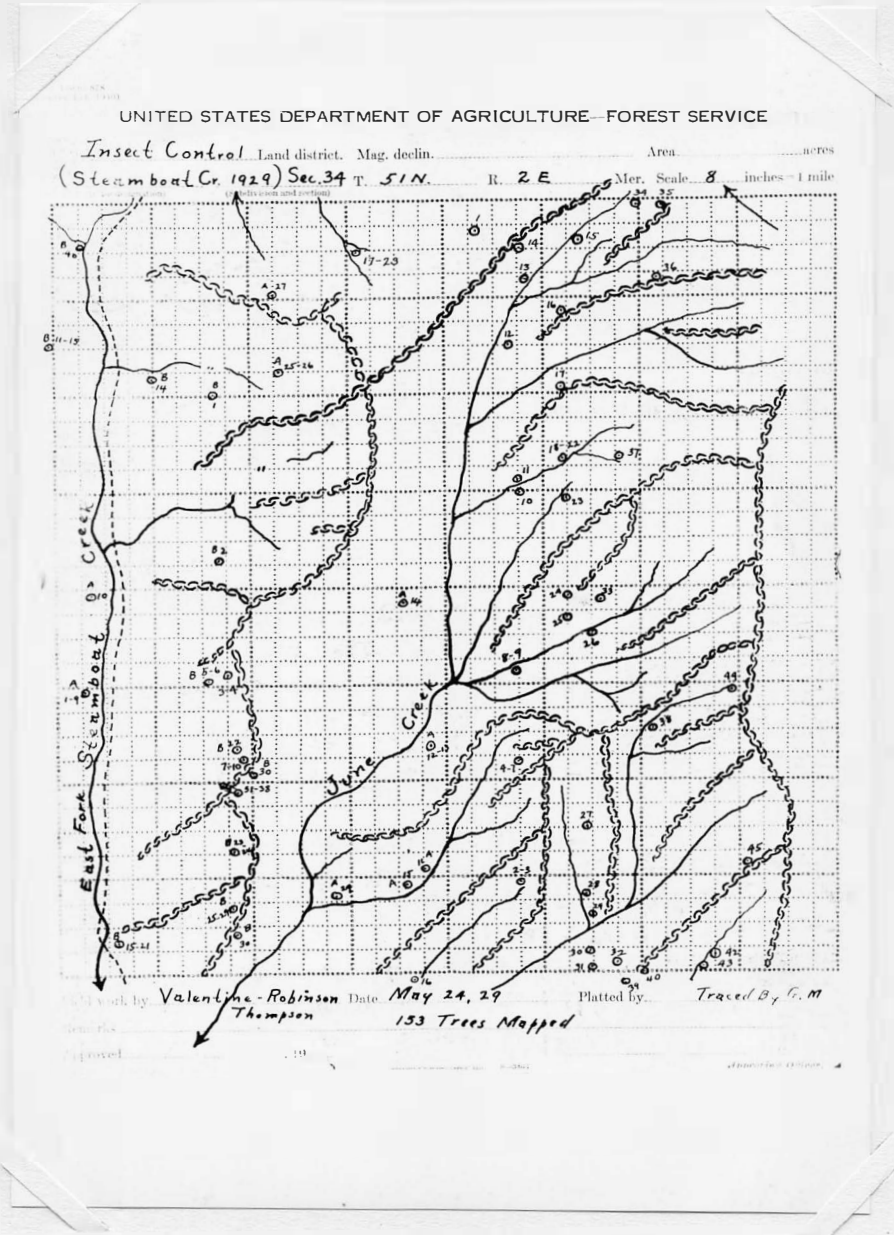
UNITED STATES DEPARTMENT OF AGRICULTURE—FOREST SERVICE
Insect Control Land district. Mag. declin. Area acres
(Steamboat Cr. 1929) Sec. 34 T. 51 N. R. 2 E Mer. Scale 8 inches = 1 mile
East Fork Steamboat Creek
June Creek
Valentine - Robinson Thompson
Date May 24, 29
Platted by
Traced By C. M
153 Trees Mapped

Fig. 1 - Field map on standard Forest Service Form 878, showing method of mapping infested trees.

The usual method employed is for the compassman to proceed slowly until one of the spotters shouts "Bugs", which indicates that he has located an infested tree. The compassman then stops, calls a number to the spotter, and maps in the location of the tree. The tree numbers should be consecutive so as to facilitate their location by the treating crews. When a group of trees is located, a circle showing the location of the group and the included numbers, such as 17-24, will be used to show their location. The compassman should progress as slowly as necessary to permit the spotters to examine all trees thoroughly on their strips. When the end of the strip is reached, the compassman offsets 4 chains south and proceeds west in the same manner. The inside spotter should always be the man who on the previous strip was on the outside, as he will be familiar with the territory being covered. At the end of the day's work, the map constructed should be transferred to what will be the completed map. The number of copies of this map which will be required will vary, though usually there will be one copy for the camp manager, one for each of the treating crews working in the area covered by the map, and one for the office files.

Each spotter is responsible for the examination of all trees on a strip <u>one chain</u> wide on one side of and parallel to the course of the compassman. The two inside spotters guide on the compassman and the two outside spotters guide on the inside spotters so that they can maintain a proper alignment or formation. The best results are secured when the crew maintains a slight V-shape formation. In this manner the strips are held to a width of one chain, which has been found to be the maximum width that can be covered if <u>every tree</u> is examined properly. The need for examining every tree will be explained under the next heading, "Recognition of Infested Trees". When an infested tree is located, the spotter fastens a tag, on which is written the tree number given him by the compassman and his own initials, to the tree by tacking the two upper corners. In addition to the tag, a blaze is placed on the opposite side of the tree on which is also written the tree number and the spotters initials.

The chief spotter works over the entire 4-chain strip behind his crew and is responsible for the alignment of his organization, the correct marking of all trees for treatment, and in fact the entire activity of the crew. In this way he is able to supervise the men properly, and it is only <u>through ~~the~~ efficient and adequate supervision that effective spotting can be secured.</u>

It is often erroneously assumed that the presence of red-tops can be used as a guide to locate new attacks and that it is not necessary to cover the entire area. This is an improper belief, as such a procedure will not locate new spots of infestation where there is no discolored foliage. Therefore, in order to locate all infested trees, it will be necessary to spot the area 100 percent by running strip lines up and down the slope and projecting them sufficiently far into the lodgepole type to insure complete coverage.

Recognition of Infested Trees:

The Douglas fir beetle is a small, reddish-brown to black, hard-shelled beetle approximately 3/10 of an inch in length. During its life, it passes through four stages. The adult beetle lays eggs which hatch into small, white, legless larvae or grubs. These grubs feed on the inner bark and finally change into white pupae which is the resting stage. The pupae in turn transform into the adult beetles.

In attacking a tree, several thousand adult beetles bore through the bark and construct egg galleries up the trunk parallel to the grain of the wood between the bark and the wood. The eggs are laid along the sides of these galleries and the larvae excavate feeding tunnels at right angles to the egg galleries. At the ends of these larval mines, the larvae transform to pupae and upon reaching the adult stage, bore out through the bark and emerge.

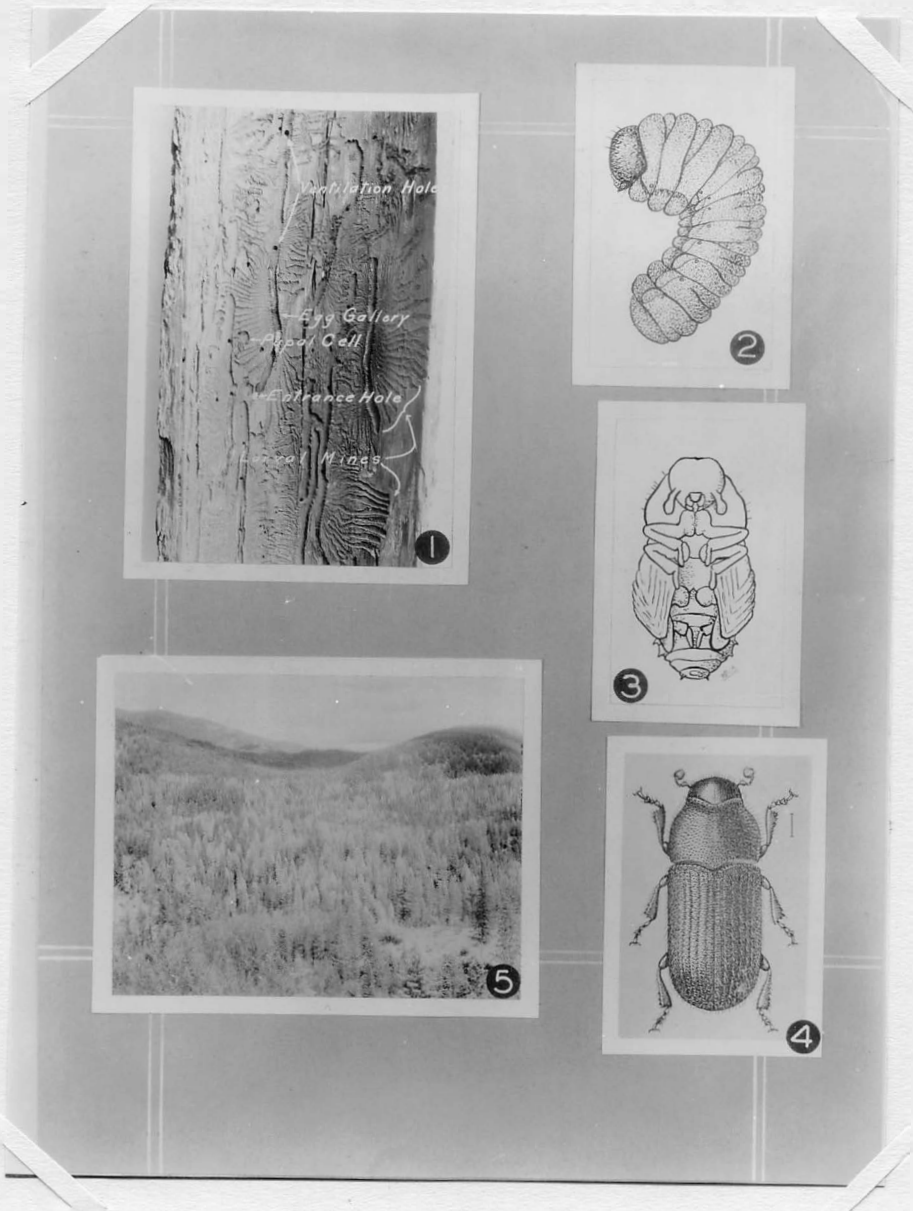

Fig. 2 - The Douglas fir beetle: (1) Inside of bark showing work of beetle. (2) Larva. (3) Pupa. (4) Adult. (5) Infested trees.

A year or two after attack the foliage of the infested trees fades and drops. However, as there are many variations of foliage discoloration, spotters must not attempt to use red or faded foliage as a guide for marking. The base of every tree must be examined for the presence of reddish-brown boring dust which is produced when the beetles bore through the bark and is caught in the bark crevices. If this dust is present, slabs of bark must be removed to determine if living broods of the Douglas fir beetle are present. These insects will be, for the most part, in the new adult stage, although a few trees will contain larvae and pupae.

Care must be exercised to avoid the improper marking of trees. In this regard, the spotter should examine the trees carefully to be certain (1) that the tree has been attacked by the Douglas fir beetle and not some other insect or disease, and (2) that there are living broods of the Douglas fir beetle within the tree and that they have not already emerged. The chief spotter must check all trees to be sure they are properly marked.

Treating

The only successful method of treating infested Douglas fir is by burning the infested portion of the trunk. The trees are felled, cut into uniform lengths, piled into decks and burned. The success of the project depends largely upon the efficiency of this phase of the work. Poor deck construction results in incomplete burning and is often the source of subsequent reinfestation. Decks built too close to green trees invariably burn the green trees so badly as to make them highly susceptible to future insect attack. Stumps must be peeled and the bark burned to destroy the insect brood in it. The work must be closely supervised from the felling of the trees to the inspection of the burned-out decks to insure satisfactory results.

Crew Organization and Equipment:

The treating crews usually comprise five men, including two sawyers and three deckers. The sawyers are equipped with a 5½ foot cross-cut saw, two narrow felling wedges, a 4 pound single jack hammer, and a double-bitted ax. The three treaters or deckers each carry an ax and a canthook.

Work Administration:

The number of 5-man treating crews that one foreman can supervise depends largely upon the number of attacked trees per acre. In areas of scattered infestation, only one or two crews can be properly directed by one foreman, while in areas where the infested trees are relatively numerous, three small crews can be kept busy with a minimum of lost time. Treating crews under one foreman should not work so close together that there will be interference from the felling of trees, nor so far apart that adequate supervision on the part of the foreman will be difficult. The crew foreman uses the spotters map to relocate the trees marked for treatment and directs the men to them. He must also plan the days work so that there is the least possible time lost in traveling from one infested group to another. The foreman is also responsible for the cutting of all marked trees and the proper burning of the decks.

The sawyers are charged with the removal of the spotters tags from the infested trees and marking the tree number upon the stump which provides the foreman or work supervisor in charge of camp with a means of checking the numbers of the treated trees. The tags are turned over to the crew foreman who later checks them off of the spotters list as treated. While the sawyers are felling the first tree, the rest of the crew prepares a place for the deck by choosing a somewhat level spot at least 25 feet from any green timber and placing some dry poles or limbs as flatly as possible on the ground. As the trees are felled and cut into uniform lengths convenient to handle, the deckers roll them onto the dry material and pack them as closely as possible so that no large holes or open spaces occur either in the deck or under it. The decks must not be piled crosswise on skids. This leaves an open space between the deck and the ground and as soon as the dry material burns up, the fire will almost invariably go out.

After the sawyers have finished felling and bucking the trees in one group, they go to the next as directed by the foreman. The deckers will remain and complete the decking and preparations for burning by piling dry limbs and slash around small decks to assure a good burn. Fire should be started at the lower end of all decks. Stumps must be peeled and the bark thrown onto the decks for burning. If any fire hazard exists, all decks must be trenched and no fires started until late in the afternoon or at some time when conditions are more favorable. When decks are not burned as constructed, they must be tagged in the same manner as an infested tree. The crew foreman must also construct a map showing the location and the number of the unburned decks. The tag is placed on a nearby tree and is collected by the work supervisor when his inspection shows that a complete burn of all the infested material has been accomplished.

After a deck of infested logs has been fired, it must be tended regularly until all infested bark surface has been burned. One man is usually detailed to watch several decks and he rolls unburned portions of logs into the fire before the fire burns out. It is best to fire large decks late in the afternoon, as they will burn all night and there will still be enough fire left the following morning with which to burn the ends and unburned sides of the logs. Smaller decks burn out much faster and need more attention; therefore, it is best to fire them in the morning in order that they can be tended in the afternoon.

During seasons of relatively high fire hazard, night burning must be resorted to. The decks are built and trenched by the treating crew during the day, but are burned during the night by two or three men. The fires are started at about 7 o'clock in the evening and are watched all night. By rolling the burning logs together during the night, the fire burns out pretty well by morning and with care there will be no danger of the fire spreading. However, such decks must be watched during the following day or until there is no more fire present.

The following pictures will serve to illustrate the method of decking infested logs.

Hand skidding infested Douglas fir logs into decks for burning.

A large deck ready to be fired. The logs in this deck are not of uniform length and some trouble is experienced from unburned ends.

The remains of a deck rolled in for a final burning.

Rolling in the two outside logs of a 30-log deck to burn the remaining bark.